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BUREAU OF FISHERIES
FRANK T. BELL, Commissioner

Administrative Report No. 22

PROPAGATION AND DISTRIBUTION OF FOOD FISHES

FISCAL YEAR 1935

By GLEN C. LEACH and M. C. JAMES

APPENDIX IV TO REPORT OF COMMISSIONER OF FISHERIES
FOR THE FISCAL YEAR 1935

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ADMINISTRATIVE REPORT SERIES

Since the advent of the Administrative Report Series, considerable confusion has arisen concerning its system of numbering the separates composing it. Inasmuch as the Reports of the Divisions vary in order from year to year, many have found their designations as "Appendix No. I, II, III, or IV" very confusing. To relieve this, it has been decided to number them as "Administrative Report No. —." Inasmuch as 20 separates had already been printed in this series before starting the numbers, it was deemed advisable to begin the numbering with Administrative Report No. 21. Of course, numbers cannot be printed on those already off the press, but for the information of those who wish to know what the first 20 were, they are numbered for filing purposes as follows

No. 1. Report, Commissioner of Fisheries, 1931.
No. 2. Alaska Fishery and Fur-Seal Industries, 1930.
No. 3. Fishery Industries of the United States, 1930.
No. 4. Progress in Biological Inquiries, 1930.
No. 5. Propagation and Distribution of Food Fishes, 1931.
No. 6. Report Commissioner of Fisheries, 1932.
No. 7. Alaska Fishery and Fur-Seal Industries, 1931.
No. 8. Fishery Industries of the United States, 1931.
No. 9. Progress in Biological Inquiries, 1931.
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No. 11. Alaska Fishery and Fur-Seal Industries, 1932.
No. 12. Progress in Biological Inquiries, 1932.
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No. 14. Propagation and Distribution of Food Fishes, 1933.
No. 15. Fishery Industries of the United States, 1933.
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No. 17. Progress in Biological Inquiries, 1933.
No. 18. Propagation and Distribution of Food Fishes, 1934.
No. 19. Alaska Fishery and Fur-Seal Industries, 1934.
No. 20. Fishery Industries of the United States, 1934.

Note that the last Commissioner's Report was for 1932. Since then its place has been taken by a reprint from the Report of the Secretary of Commerce under the title "Bureau of Fisheries." Inasmuch as it is no longer a Bureau publication, it is not numbered; but it will be supplied to any who request the Report of the Commissioner for any year since 1932.

PROPAGATION AND DISTRIBUTION OF FOOD FISHES, FISCAL YEAR 1935[1]

By Glen C. Leach, *Chief*, and M. C. James, *Assistant Chief, Division of Fish Culture*

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INTRODUCTION

The output of fish and eggs from the Federal hatcheries again showed an upward trend in 1935, in contrast with the curtailment imposed during the fiscal year 1934. The resumption of work at one of the marine hatcheries, made possible by a slight increase in appropriations, together with enlargements and improvements effected by relief funds and labor at other hatcheries, was responsible for a distinct increase in production.

While there still appears to be uncertainty and confusion as to the best means of conserving and perpetuating other forms of wildlife, the operation of hatcheries remains at hand as a proven means of maintaining fish life particularly in interior waters. It is fully recognized that some species under certain conditions have failed to respond to fish-cultural methods, and it is also admitted that stocking may lack effectiveness when it is conducted on haphazard hit-or-miss lines. The fact remains, however, that each game fish planted

[1] Administrative Report No. 22, Appendix IV to the Report of the U. S. Commissioner of Fisheries for 1935. Approved for publication, Jan. 14, 1936.

in lake or stream is an increment to the normal fish resources of that body of water, and eggs of a commercial species fertilized, hatched, and planted as a byproduct of a commercial fishery are an asset of that commercial fishery.

Public acceptance of this fact has resulted in a flood of recommendations and requests urging the general establishment of new hatcheries in all parts of the country. Aside from the fact that funds are not available, either for construction or maintenance of such projects, it is essential to understand that natural limitations very frequently make it desirable to concentrate the propagation work in a few of the larger more efficient hatcheries. The conception of numerous local rearing ponds for the purpose of "finishing off" the hatchery products is sound, but these are much more modest projects than are visualized by the average sportsmen's group interested in securing a Federal or State hatchery for that section. However, the system of Federal hatcheries is as yet incomplete as far as certain sections of the country are concerned, and these sections will be inadequately stocked until some new hatcheries are built.

The following tables and statistics are presented as a listing, in part, of the raw material available for anglers of 1936, 1937, and subsequent years.

SPECIES PROPAGATED

Forty-three different species were propagated in sufficient numbers to warrant a separate listing, and several miscellaneous forms were handled in small numbers largely in an experimental way. Included in the output were pollock which were not propagated during the previous year. No pink or humpback salmon were produced, but a moderate number of cisco or lake herring eggs were secured and hatched. Many of the species shown on the following list are planted directly from the hatcheries, private applicants not participating in this distribution.

Catfishes (Siluridae):
- Catfish (*Leptops olivaris*).
- Spotted catfish (*Ictalurus punctatus*).
- Horned pout (*Ameiurus nebulosus*).

Carp (Cyprinidae): Common carp (*Cyprinus carpio*).

Buffalofish (Catostomidae): Common buffalo (*Ictiobus sp.*).

Shad and Herring (Clupeidae):
- Shad (*Alosa sapidissima*).

Salmons, Trouts, and Whitefishes (Salmonidae):
- Common whitefish (*Coregonus clupeaformis*).
- Chinook, king, or quinnat salmon (*Oncorhynchus tschawytscha*).
- Chum salmon (*Oncorhynchus keta*).
- Coho salmon, silver salmon (*Oncorhynchus kisutch*).
- Red salmon, sockeye, or blueback salmon (*Oncorhynchus nerka*).
- Steelhead salmon (*Salmo gairdneri*).
- Atlantic salmon (*Salmo salar*).
- Landlocked salmon (*Salmo sebago*).
- Rainbow trout (*Salmo shasta*).
- Black-spotted trout, redthroat trout (*Salmo lewisi*).
- Loch Leven trout (*Salmo levenensis*).
- Lake trout, Mackinaw trout (*Cristivomer namaycush*).
- Brook trout (*Salvelinus fontinalis*).

Graylings (Thymallidae): Montana grayling (*Thymallus montanus*).

Pikes (Esocidae): Pike and pickerel (Esox sp.).

SUNFISHES (CENTRARCHIDAE):
Crappie (*Pomoxis annularis* and *P. sparoides*).
Largemouth black bass (*Micropterus salmoides*).
Smallmouth black bass (*Micropterus dolomieu*).
Rock bass (*Ambloplites rupestris*).
Warmouth bass, goggle-eye (*Chaenobryttus gulosus*).
Bluegill sunfish (*Lepomis incisor*).
Green sunfish (*Lepomis cyanellus*).
Redbreasted bream (*Lepomis auritus*).
Red-eared sunfish (*Lepomis heros*).
Common sunfish (*Lepomis gibbosus*).
Rio Grande perch (*Herichthys cyanoguttatus*).
PERCHES (PERCIDAE):
Pike perch (*Stizostedion vitreum*).
Yellow perch, ringed perch (*Perca flavescens*).
WHITE BASSES (SERRANIDAE):
White bass (*Roccus chrysops*).
White perch (*Morone americana*).
DRUMS (SCIAENIDAE): Fresh-water drum, lake sheepshead (*Aplodinotus grunniens*).
CODS (GADIDAE):
Cod (*Gadus callarias*).
Haddock (*Melanogrammus aeglefinus*).
Pollock (*Pollachius virens*).
FLOUNDERS (PLEURONECTIDAE): Winter flounder, American flatfish.
MACKEREL (SCOMBRIDAE): Common mackerel (*Scomber scombrus*).

Summary, by species, of the output of fish and fish eggs during the fiscal year ending June 30, 1935

Species	Eggs	Fry	Fingerlings	Total
Catfish	160,000		16,486,300	16,646,300
Buffalofish	191,377,000	46,500	3,380,900	194,804,400
Carp	87,400,000	142,000	8,284,950	95,826,950
Shad		11,430,000	3,350	11,433,350
Whitefish	50,000	39,239,000		39,289,000
Lake herring (cisco)	320,000	2,320,000		2,640,000
Chinook salmon			22,521,000	22,521,000
Chum salmon		15,454,300		15,454,300
Silver salmon	182,700		2,097,000	2,279,700
Sockeye salmon			1,860,100	1,860,100
Steelhead salmon	50,000	47,300	1,153,400	1,250,700
Atlantic salmon	775,000		85,000	860,000
Landlocked salmon			138,950	138,950
Rainbow trout	3,356,630	15,000	9,983,200	13,353,730
Blackspotted trout	3,851,160		22,323,800	26,174,960
Lock Leven trout	9,052,160	7,138,745	5,721,295	21,912,200
Lake trout	2,306,000	1,662,500	106,450	4,074,950
Brook trout	10,159,900	2,080,000	16,299,000	28,538,900
Grayling	1,184,000			1,184,000
Pike and pickerel			36,900	36,900
Crappie			6,967,550	6,967,550
Black bass:				
Largemouth		560,750	2,545,250	3,106,000
Smallmouth		1,147,500	239,900	1,387,400
Rock bass			236,400	236,400
Warmouth bass			36,600	36,600
Sunfish			10,603,300	10,603,300
Pike perch	510,075,000	5,620,000		515,695,000
Yellow perch		451,000,000	491,600	451,491,600
White perch		1,920,000		1,920,000
Freshwater drum			4,400	4,400
White bass			34,600	34,600
Miscellaneous fishes			2,043,700	2,043,700
Mackerel		2,123,000		2,123,000
Cod	1,679,043,000			1,679,043,000
Haddock	236,836,000			236,836,060
Flatfish (flounder)	336,311,600	918,518,000		1,254,829,600
Pollock	309,304,000	95,782,000		405,086,000
Total	3,381,794,450	1,556,246,595	133,683,955	5,071,725,000

PRODUCTION

An increase of approximately 1,800,000,000 in the output of fish and eggs over the previous year's figures was a sharp reversal in the downward trend of production. It is true that more extensive operations with the marine species were largely contributory to the increase, but the output of a number of other species was likewise augmented. Among these were the whitefish, chum salmon, silver salmon, Atlantic salmon, smallmouth bass, sunfish, and yellow perch. During the year only four hatcheries remained entirely out of productive operations, although several others were operated on a restricted basis in comparison with previous years.

There is always interest in the proportion of game fishes included in the total output. For 1935 the strictly game species were propagated to the number of 114,571,550, representing about 2.2 percent of the total. This compares with a larger output of 135,211,900 for 1934. However, the latter year shows the production of fingerlings and larger fish at a larger figure, 133,683,955, an increase of over 7,000,000. This, in part, accounts for the drop in the total output of game fish, since numerical production must inevitably decline when the fish are reared to a greater size before distribution. There is every reason to believe that the increased stocking value of the bigger fish compensates for the smaller numbers planted.

Indulgence in speculative computations will reveal that the output of game fish from Federal hatcheries would yield a prorated catch of 11 fish to each of the estimated 10,000,000 anglers in the country if all fish survived and were taken. Considering that in many sections practically all game fish taken are planted stock, it will be evident that there is little imminence of a "saturation point" in hatchery operations.

CONSTRUCTION ACTIVITIES

At the start of the year there were small unexpended balances in approximately 12 allotments for the repair and reconditioning of fish hatcheries. These allotments had been made by the Public Works Administration during the previous year, and the work was carried to a conclusion during the fiscal year 1935. A considerable proportion of a similar allotment for the continued development of the Leetown, W. Va., experimental hatchery remained available and was expended in part for the construction of bass and trout ponds, remodeling of one of the buildings, and construction of a new dwelling. Early in the year a new Public Works allotment of $75,000 was received for the construction of a pond-fish hatchery at Harrison Lake, Va., 26 miles southeast of Richmond. Work was started during the winter and at the close of the year approximately 15 acres of ponds were virtually completed and other developments were well along to the point where the establishment could go into active operation during the fall of 1935. Arrangements were being made for the propagation of shad as well as pond fish at this point. Two dwellings as well as various service buildings comprised the structural improvements. The water supply, which is obtained from a lake, is fed through a canal. In general, the construction and improvements effected during the fiscal years 1934 and 1935 can be credited in part for the increased hatchery output attained during the latter year. Throughout 1935 labor was assigned to several of the Bureau's

stations by local F. E. R. A. offices. Lack of funds for materials made it impossible to perform major construction jobs by this means, but upkeep and maintenance work of real value was accomplished.

COOPERATION WITH OTHER CONSERVATION AGENCIES

The perfection of cooperative relationships with other Federal conservation bureaus, and with many of the State fish and game departments has become such a routine administrative matter that it hardly warrants special mention in this report. In view of the stress laid upon this feature, however, it is desirable to cite a few instances as examples of the possibilities of coordination in fish-cultural work.

The nature of the work performed by the National Park Service, Forest Service, the Office of Indian Affairs, the Bureau of Reclamation, and the Bureau of Biological Survey, gives them of necessity an interest in the Bureau's fish-cultural work. The stocking of streams and lakes under the control of the foregoing agencies is an important feature of their administration. Consequently, it has been necessary to maintain closer contact with these establishments, and it is felt that the Bureau has been of real service in numerous instances.

While these cooperative relationships are of more or less standing nature, there have been contacts with the newer emergency organizations which offer prospects of mutual value. The Agricultural Adjustment Administration, insofar as its work covers the utilization of marginal lands, has called upon the Bureau in several instances to plan a program for fish propagation and the provision of angling.

At the close of the year plans were being developed for one project in North Carolina whereby a hatchery would be constructed and turned over to the Bureau for subsequent operation with the object of providing fish for the surrounding territory.

The Bureau has been called upon to make a survey in the Tennessee Valley to aid the Tennessee Valley Authority in developing a program of conserving fishery resources and establishing a hatchery system.

The United States Army Engineers have given sympathetic consideration to the Bureau's recommendations with regard to developments in the Upper Mississippi River area. This has been based upon a hope that the dams comprising part of the 9-foot channel development might be modified so as to provide extensive propagating ponds for the production of fish native to that area.

With reference to the States, arrangements have been made for several additional States to review Federal applications for fish in order to assure that no undesirable species will be planted, and that the stocking will be in conformity with the natural demands and possibilities of the lakes and streams.

The State of Vermont has afforded generous help in a financial way in meeting the costs of operation at the extensive brook trout egg-producing plant maintained by the Bureau in the White Mountain National Forest, N. H.

Tennessee and West Virginia have furnished food for fish held at the Bureau's hatcheries and have handled the distribution of these fish when they were ready for release.

A number of the Western States have continued to supply helpful cooperation in the collecting of trout eggs and are compensated therefor by receiving a proportion of the eggs taken. There has

been a joint operation of trout and shad hatcheries in the State of South Carolina.

The State of Washington donated a site for a trout rearing station which was developed by the Bureau to furnish a supply of fish for the eastern part of the State where we lacked such facilities.

The mutual benefits of these relationships may be exemplified by citing the situation in the State of Indiana. This State has a limited mileage of trout waters but rather than incur the expense of a trout hatchery, it is allotted several hundred thousand trout fry from Federal hatcheries in other States. In return the State utilizes its facilities in distributing practically all of the fish produced at the Federal hatchery at Rochester, Ind.

The machinery through which these plans became effective is the National Planning Council of Federal and State Fisheries Authorities. The several regional meetings of the organization held during the year have brought about results fully justifying its formation.

The Bureau has been less active in sponsoring the establishment of fish rearing ponds or nurseries to be maintained and operated by private sportsmen's organizations. This movement is well developed now and while fish from Federal hatcheries are always available for suitable club nurseries, it is felt that the initiative should be taken by the groups which are to benefit most. We have continued to furnish assignments to nurseries which have been in operation for several years. Special effort has been made to render informational service by supplying technical data upon the problems of fish rearing, and acting in an advisory capacity. In this connection it is possible to be of as great service by pointing out the futility of attempting to rear fish under adverse conditions, as it is to lay out a rearing plant and formulate a program for its operation. The artificial propagation of fish is enough of a technical enterprise to require the supervision of technical men to give best results.

The extent of the cooperative relationships with private clubs operating rearing ponds and nurseries was practically unchanged so far as the number of organizations was concerned. Sixty-seven units received fish in comparison with 62 during the previous year. However, the total number of fish assigned was considerably reduced, allotments amounting to 1,750,000, a reduction of more than a million from the assignments made the previous year. This is attributed to increased rearing facilities at the Bureau's own stations, and the fact that better results are obtained by avoidance of overstocking of private rearing ponds.

SALVAGE OPERATIONS

By the expenditure of a few cents per thousand fish, it is possible to transfer tens of millions of fish which face sure destruction in the overflowed sloughs of the Upper Mississippi River, to living waters where they can survive. It has been the practice each year to salvage these bass, sunfish, crappie, perch and other game and commercial fish, as one of the chief activities in the administration of the Upper Mississippi Wild Life Refuge. The magnitude of the work varies according to river conditions, and in 1935 over 47,000,000 fish were rescued in comparison with 23,873,000 handled the previous year. Only 105,000 were used in restocking other waters, the balance being restored to the river. Fish raised in artificial controlled ponds are now being more widely used for general stocking purposes. Plans

have been prepared for an extensive series of hatchery ponds which will be required when the development of the 9-foot channel will, through the maintenance of constant water levels, have eliminated the necessity of salvaging fish.

Number and disposition of fish rescued, fiscal year 1935

Locality and species	Delivered to applicants	Restored to original waters	Total number of fish rescued
All stations:			
Black bass	62,615	208,555	271,170
Buffalofish		4,030,420	4,030,420
Carp		8,423,000	8,423,000
Catfish	20,350	16,613,950	16,634,300
Crappie	348	6,965,652	6,966,000
Drum		4,400	4,400
Pike and pickerel		36,890	36,890
Sunfish	10,395	8,272,465	8,282,860
White bass		34,660	34,660
Yellow perch		423,145	423,105
Miscellaneous fishes		2,043,700	2,043,700
Total	105,668	47,056,837	47,162,505
Summary by stations:			
Fairport		658,388	658,388
La Crosse	24,764	3,372,336	3,397,500
Lynxville	1,990	4,445,280	4,447.270
Bellevue		6,021,650	6,021,650
Homer	43,033	8,566,621	8,609,704
Marquette	35,831	23,886,494	23,922,325
Total	105,668	47,056,837	47,162,505

NOTE.—Carp listed herein are returned only to the Mississippi River where a commercial fishery for the species exists. None are planted in game fish waters.

ASSIGNMENTS OF FISH AND FISH EGGS TO STATES, TERRITORIES, AND FOREIGN COUNTRIES

The activity of the Bureau in assigning numerous fish and fish eggs to various State fish and game departments may be likened to a wholesale enterprise. These eggs are delivered both from hatchery brood stock and from collections obtained by trapping wild fish. They are the raw material used in operations at the State hatcheries. Many of them are furnished on an exchange basis or under cooperative arrangements whereby the recipients meet part of the costs of collections, while in other instances they are outright donations. The assignments of eggs and fish to the States in 1935, numbering 562,323,860, were more than in 1934 by 188,440,860.

It may be pointed out further that the Bureau also has an "export" business in eggs and fish. Each year there are several requests for advice and assistance in programs of establishing American fishes in foreign countries. Many of these plans do not materialize due to unsuitable conditions abroad. However, some shipments are occasionally furnished by the Bureau, and the table below shows the extent of this activity during 1935. The assignment of trout eggs to Canada was in compensation for Atlantic salmon eggs furnished by the Dominion. The shipment to Venezuela was especially noteworthy in that there was a high rate of survival (80 percent in case of one species) of varieties which are difficult to transport for long distances.

Assignment of fish and fish eggs to State fish commissions, fiscal year 1935

States and species	Number
Arizona:	
Brook trout	10,000
Rainbow trout	35,000
California: Grayling	5,000
Colorado: Rainbow trout	102,000
Connecticut:	
Lake trout	25,000
Rainbow trout	100,000
Georgia: Rainbow trout	200,000
Idaho:	
Blackspotted trout	25,000
Grayling	370,000
Rainbow trout	18,600
Maine:	
Atlantic salmon	775,000
Brook trout	1,078,000
Massachusetts: Rainbow trout	100,000
Michigan:	
Brook trout	50,000
Grayling	150,000
Montana:	
Brook trout	759,000
Loch Leven trout	1,896,000
Black bass	42,870
Catfish	65,745
Crappie	8,375
Sunfish	33,320
Yellow perch	3,980
Nebraska:	
Brook trout	25,000
Rainbow trout	293,000
Nevada:	
Brook trout	150,000
Rainbow trout	1,008,000
New Hampshire:	
Lake herring	320,000
Rainbow trout	25,000
New Mexico:	
Blackspotted trout	250,000
Chinook salmon	197,000
New York: Rainbow trout	260,000
North Carolina: Rainbow trout	582,000
Ohio:	
Pike perch	510,000,000
Whitefish fry	37,000,000
Oregon:	
Blackspotted trout	250,000
Silver salmon	131,500
Steelhead salmon	50,000
Pennsylvania: Rainbow trout	250,000
South Carolina: Rainbow trout	150,000
Tennessee: Rainbow trout	550,000
Utah:	
Brook trout	101,920
Grayling	150,000
Vermont:	
Brook trout	2,199,550
Rainbow trout	35,000
Washington:	
Blackspotted trout	68,000
Brook trout	167,000
Loch Leven trout	50,000
Rainbow trout	358,000
West Virginia: Brook trout	550,000
Wyoming:	
Blackspotted trout	1,250,000
Lake trout	50,000
Total	562,323,860

Shipments of fish and fish eggs to foreign countries, fiscal year, 1935

Country and species	Eggs	Yearlings, adults
Canada: Blackspotted trout	1,000,000	
Cuba:		
Black bass, largemouth		60
Crappie		114
Warmouth bass		126
Panama:		
Black bass, largemouth		325
Carp		11
Catfish		100
Crappie		25
Sunfish		250
Yellow perch		75
Puerto Rico:		
Rainbow trout	50,000	
Catfish		300
Sunfish		1,800
Venezuela:		
Rainbow trout	50,000	
Bluegill sunfish		105
Carp		130
Crappie		30
Largemouth black bass		235
Yellow perch		75
Total	1,100,000	3,761

TRANSFER OF EGGS BETWEEN STATIONS

While the interhatchery transfer of fish eggs is more or less a routine administrative matter, the following tabulation is cited to demonstrate the extent of this practice. Many of the eggs so transferred are collected from wild fish at suitable locations, and the maintenance of expensive brood stock is avoided. With a sufficient return of fish to parental waters the wild producing stock maintains itself with adequate abundance.

Transfer of eggs between stations, fiscal year 1935

Species	Number of eggs	From—	To—
Blackspotted trout	106,400	Saratoga, Wyo	Bozeman, Mont.
	53,200	do	Hagerman, Idaho.
	104,590	do	Jackson Hole, Wyo.
	53,200	do	Springville, Utah.
	2,000,000	Yellowstone Park, Wyo	Jackson Hole, Wyo.
	250,000	do	Quilcene, Wash.
	100,000	do	Springville, Utah.
Brook trout	260,000	Berkshire, Mass	LaCrosse, Wis.
	1,100,000	Berlin, N. H. (national forest)	Cape Vincent, N. Y., and suburbs.
	253,825	do	Erwin, Tenn.
	2,130,700	do	St. Johnsbury, Vt.
	700,000	do	White Sulphur Springs, W. Va.
	500,000	do	Wytheville, Va.
	400,000	Craig Brook, Maine	Cape Vincent, N. Y.
	350,000	do	Erwin, Tenn.
	600,000	do	Leetown, W. Va.
	50,000	do	Manchester, Iowa.
	360,700	do	Nashua, N. H.
	550,000	do	White Sulphur Springs, W. Va.
	500,000	do	Wytheville, Va.
	451,250	Creede, Colo	Crawford, Nebr.
	301,840	do	Duluth, Minn.
	150,300	do	Hagerman, Idaho.
	200,800	do	Manchester, Iowa.
	422,550	do	Saratoga, Wyo.
	100,450	do	Spearfish, S. Dak.
	1,010,400	do	Springville, Utah.
	359,000	Leadville, Colo	La Crosse, Wis.
	62,000	do	Lake Mills, Wis.
	50,000	Pittsford, Vt	Leetown, W. Va.
	250,000	do	Nashua, N. H.
Chinook salmon	202,800	Clackamas, Oreg	Leadville, Colo.
	100,000	Butte Falls, Oreg	Clackamas, Oreg.
Landlocked salmon	20,000	Craig Brook, Maine	Nashua, N. H.
Loch Leven trout	14,299,400	Ennis, Mont	Bozeman, Mont.
	95,000	Leadville, Colo	Eagle Nest, N. Mex.
	183,000	Ennis, Mont	Meadow Creek, Mont.
Rainbow trout	100,000	Bourbon, Mo	Aquarium, Washington, D. C.
	200,000	do	Crawford, Nebr.
	200,000	do	Flintville, Tenn.
	400,000	do	Saratoga, Wyo.
	567,000	Manchester, Iowa	Bozeman, Mont.
	209,000	do	Creede, Colo.
	92,000	do	Duluth, Minn.
	104,000	do	Hagerman, Idaho.
	107,000	do	Leadville, Colo.
	319,000	do	La Crosse, Wis.
	350,000	do	Northville, Mich.
	61,000	do	Lake Mills, Wis.
	209,000	do	Spearfish, S. Dak.
	201,000	Neosho, Mo	Bozeman, Mont.
	163,000	do	Crawford, Nebr.
	90,000	do	Hagerman, Idaho.
	100,000	do	Leadville, Colo.
	104,000	do	Spearfish, S. Dak.
	50,000	Pittsford, Vt	Leetown, W. Va.
	58,000	Springville, Utah	Hagerman, Idaho.
	100,000	do	Bear Lake, Utah.
Steelhead salmon	50,000	Butte Falls, Oreg	Charlevoix, Mich.

STATION OUTPUT

The following table, showing the producing hatcheries and the output by species of each, carries a total of 77 units of which 43 are main stations and 34 substations. The summary last year showed 83 stations and substations, but for administrative reasons a number of closely related substations such as field stations in the Upper Mississippi River and bass ponds around the Fort Belvoir, Va., station were consolidated as far as reports of output are concerned. Actual changes therefore involved the closure of one main station in Alaska, opening of two in the States, and the actual number of fish producing units was one more than last year, namely, 84. They

are located in 38 States, but State lines are entirely disregarded in distributing the output.

The carp listed in the following table comprise fish handled in rescue work, or eggs fertilized and hatched at stations located in that territory. The planting of carp is confined to waters which already support an important commercial fishery for the species and they are not distributed in other waters.

Stations and substations operated and the output of each, fiscal year 1935

Stations and substations and species	Eggs	Fry	Fingerlings, yearlings, and adults	Total
Baird, Calif.: Chinook salmon			1,495,100	1,495,100
Battle Creek, Calif.; Chinook salmon			3,492,000	3,492,000
Mill Creek, Calif.: Chinook salmon			2,369,100	2,369,100
Baker Lake, Wash.:				
Blackspotted trout			94,000	94,000
Brook trout			257,500	257,500
Loch Leven trout			80,500	80,500
Rainbow trout			48,400	48,400
Sockeye salmon			25,900	25,900
Birdsview, Wash.:				
Blackspotted trout			294,400	294,400
Brook trout			180,000	180,000
Loch Leven trout			85,000	85,000
Rainbow trout			137,500	137,500
Silver salmon			413,000	413,000
Sockeye salmon			404,000	404,000
Steelhead salmon			603,000	603,000
Mount Rainier, Wash.:				
Blackspotted trout			250,000	250,000
Brook trout			260,000	260,000
Rainbow trout			93,850	93,850
Berkshire Trout Hatchery, Mass.:				
Brook trout			173,700	173,700
Catfish			4,730	4,730
Smallmouth black bass		786,500		786,500
Boothbay Harbor, Maine:				
Cod	729,168,000			729,168,000
Flatfish		774,000,000		774,000,000
Haddock	120,401,000			120,401,000
Bozeman, Mont.:				
Blackspotted trout	1,001,160		3,408,010	4,409,170
Brook trout			470,410	470,410
Loch Leven trout	6,795,040			6,795,040
Rainbow trout	102,900		423,700	526,600
Ennis, Mont.:				
Blackspotted trout			308,555	308,555
Loch Leven trout	2,257,120	7,138,745	1,138,500	10,534,365
Rainbow trout			168,490	168,490
Glacier Park, Mont.:				
Blackspotted trout			1,372,180	1,372,180
Grayling	509,000			509,000
Rainbow trout			85,060	85,060
Miles City, Mont.:				
Black bass, largemouth			121,945	121,945
Catfish			87,530	87,530
Crappie			53,595	53,595
Sunfish			91,235	91,235
Yellow perch			5,805	5,805
Cape Vincent, N. Y.:				
Brook trout			1,700	1,700
Lake herring (cisco)	320,000	2,320,000		2,640,000
Lake trout	25,000	240,000	1,400	266,400
Black bass, smallmouth			73,240	73,240
Whitefish		679,000		679,000
Barneveld, N. Y.:				
Brook trout			107,100	107,100
Lake trout			16,000	16,000
Landlocked salmon			500	500
Loch Leven trout			2,400	2,400
Rainbow trout			19,630	19,630
Cortland, N. Y.:				
Brook trout			169,575	169,575
Loch Leven trout			36,980	36,980
Rainbow trout			1,610	1,610
Watertown, N. Y.:				
Brook trout			46,630	46,630
Lake trout			66,050	66,050
Loch Leven trout			76,395	76,395
Rainbow trout			1,900	1,900

Stations and substations operated and the output of each, fiscal year 1935—Continued

Stations and substations and species	Eggs	Fry	Fingerlings, yearlings, and adults	Total
Cape Vincent, N. Y.—Continued.				
Rochester, N. Y.:				
Black bass:				
Largemouth			35,235	35,235
Smallmouth			22,200	22,200
Brook trout			400	400
Loch Leven trout			4,740	4,740
Rainbow trout			30,000	30,000
Clackamas, Oreg.:				
Blackspotted trout			75,000	75,000
Brook trout			385,000	385,000
Chinook salmon			2,543,900	2,543,900
Loch Leven trout			305,000	305,000
Rainbow trout			6,000	6,000
Silver salmon	1,200		42,000	43,200
Big White Salmon, Wash.:				
Chinook salmon			4,872,000	4,872,000
Butte Falls, Oreg.:				
Blackspotted trout			447,240	447,240
Chinook salmon			3,825,000	3,825,000
Silver salmon	131,500		137,500	269,000
Steelhead salmon	50,000		352,000	402,000
Little White Salmon, Wash.:				
Chinook salmon			3,872,180	3,872,180
Chum salmon		199,000		199,000
Craig Brook, Maine:				
Atlantic salmon	775,000		85,000	860,000
Brook trout	1,069,000	30,000	700,300	1,799,300
Landlocked salmon			103,800	103,800
Smelt	8,000,000			8,000,000
Crawford, Nebr.:				
Blackspotted trout			483,000	483,000
Brook trout			328,930	328,930
Loch Leven trout			168,125	168,125
Rainbow trout		15,000	603,415	618,415
Black bass, largemouth			26,400	26,400
Catfish			5,950	5,950
Crappie			2,340	2,340
Sunfish			11,100	11,100
Yellow perch			56,075	56,075
Dexter, N. Mex.:				
Black bass, largemouth			146,440	146,440
Catfish			14,000	14,000
Crappie			800	800
Sunfish			58,375	58,375
Duluth, Minn.:				
Brook trout			191,000	191,000
Lake trout		1,422,500	23,000	1,445,500
Loch Leven trout			39,000	39,000
Pike perch		5,620,000		5,620,000
Rainbow trout			23,500	23,500
Whitefish		1,560,000		1,560,000
Edenton, N. C.:				
Black bass, largemouth			41,100	41,100
Crappie			1,200	1,200
Sunfish			13,200	13,200
White perch		1,920,000		1,920,000
Yellow perch		6,600,100		6,600,100
Erwin, Tenn.:				
Black bass, largemouth			1,437	1,437
Brook trout			428,870	428,870
Rainbow trout			56,080	56,080
Rock bass			1,600	1,600
Sunfish			230,000	230,000
Fairport, Iowa:				
Black bass, largemouth		52,500	71,200	123,700
Buffalofish	110,752,600	46,500	124,550	110,923,650
Carp	7,400,000	142,000	264,550	7,806,550
Catfish			20,125	20,125
Crappie			4,200	4,200
Rock bass			7,200	7,200
Smallmouth black bass			15,250	15,250
Sunfish			115,960	115,960
Miscellaneous fishes			8,700	8,700
Flintville, Tenn.:				
Loch Leven trout			20,000	20,000
Rainbow trout			209,650	209,650
Rock bass			10,500	10,500
Sunfish			8,000	8,000
Fort Belvoir, Va.:				
Shad		11,430,000		11,430,000
Yellow perch		451,000,000		451,000,000

Stations and substations operated and the output of each, fiscal year 1935—Continued

Stations and substations and species	Eggs	Fry	Fingerlings, yearlings, and adults	Total
Gloucester, Mass.:				
Cod	949,875,000			949,875,000
Flatfish	300,452,600			300,452,600
Haddock	116,435,400			116,435,400
Pollock	309,304,000	95,782,000		405,086,000
Hagerman, Idaho:				
Blackspotted trout			215,900	215,900
Brook trout			384,500	384,500
Loch Leven trout			18,300	18,300
Rainbow trout	191,000		789,900	980,900
Steelhead salmon			12,900	12,900
Salmon, Idaho:				
Blackspotted trout			90,000	90,000
Brook trout			15,000	15,000
Rainbow trout			652,100	652,100
La Crosse, Wis.:				
Black bass:				
Largemouth			152,590	152,590
Smallmouth			560	560
Brook trout	75,000		604,250	679,250
Carp			720,000	720,000
Catfish			297,900	297,900
Crappie			487,060	487,060
Buffalofish			270,000	270,000
Drum			200	200
Lake trout	2,281,000			2,281,000
Loch Leven trout			180,600	180,600
Pike and pickerel			8,100	8,100
Rainbow trout			254,700	254,700
Sunfish			537,125	537,125
White bass			5,100	5,100
Yellow perch			14,480	14,480
Miscellaneous fishes			630,000	630,000
Bellevue, Iowa:				
Black bass, largemouth			40,300	40,300
Carp	44,000,000		2,299,000	46,299,000
Catfish			647,000	647,000
Crappie			501,000	501,000
Buffalofish	77,625,000		1,417,000	79,042,000
Freshwater drum			540	540
Pike and pickerel			1,485	1,485
Sunfish			572,000	572,000
White bass			24,150	24,150
Yellow perch			3,705	3,705
Miscellaneous fishes			515,000	515,000
Homer, Minn.:				
Black bass, largemouth			129,600	129,600
Buffalofish			10,770	10,770
Carp			1,601,400	1,601,400
Catfish			279,000	279,000
Crappie			3,033,400	3,033,400
Drum			3,060	3,060
Pike and pickerel			7,365	7,365
Sunfish			3,599,165	3,599,165
White bass			1,810	1,810
Yellow perch			383,250	383,250
Lake Mills, Wis.:				
Black bass:				
Largemouth			76,550	76,550
Smallmouth			10,650	10,650
Brook trout			55,000	55,000
Loch Leven trout			57,500	57,500
Rainbow trout			46,000	46,000
Lynxville, Wis.:				
Black bass, largemouth			5,170	5,170
Buffalofish			372,500	372,500
Carp			687,000	687,000
Catfish			1,428,000	1,428,000
Drum			600	600
Pike and pickerel			2,650	2,650
Sunfish			767,500	767,500
White bass			600	600
Yellow perch			4,900	4,900
Miscellaneous fishes			841,000	841,000
Marquette, Iowa:				
Buffalofish	3,000,000		1,185,900	4,185,900
Black bass, largemouth			54,000	54,000
Carp	36,000,000		2,714,000	38,714,000
Catfish	160,000		13,675,000	13,835,000
Crappie			2,733,000	2,733,000
Pike and pickerel			17,290	17,290
Sunfish			2,935,500	2,935,500

Stations and substations operated and the output of each, fiscal year 1935—Continued

Stations and substations and species	Eggs	Fry	Fingerlings, yearlings, and adults	Total
La Crosse, Wis.—Continued.				
Marquette, Iowa—Continued.				
White bass			3,000	3,000
Yellow perch			16,500	16,500
Miscellaneous fishes			50,000	50,000
Rochester, Ind.:				
Black bass:				
Largemouth			88,815	88,815
Smallmouth			4,790	4,790
Crappie			1,000	1,000
Rock bass			3,000	3,000
Sunfish			20	20
Yellow perch			1,000	1,000
Lamar, Pa.:				
Brook trout			23,875	23,875
Rainbow trout			14,000	14,000
Leadville, Colo.:				
Blackspotted trout			364,800	364,800
Brook trout			2,661,150	2,661,150
Loch Leven trout			135,000	135,000
Rainbow trout			325,000	325,000
Creede, Colo.				
Blackspotted trout			498,000	498,000
Brook trout	3,809,000		1,837,750	5,646,750
Loch Leven trout			179,000	179,000
Rainbow trout	75,000		1,008,000	1,083,000
Eagle Nest, N. Mex.:				
Brook trout			42,000	42,000
Rainbow trout			210,500	210,500
Leetown, W. Va.:				
Brook trout			275,530	275,530
Loch Leven trout			26,000	26,000
Rainbow trout			210,270	210,270
Smallmouth black bass		10,000		10,000
Louisville, Ky.:				
Black bass:				
Largemouth		210,000	21,610	231,610
Smallmouth		133,000	5,040	138,040
Crappie			215	215
Rock bass			4,250	4,250
Sunfish			20,400	20,400
Mammoth Spring, Ark.:				
Black bass:				
Largemouth		17,000	326,300	343,300
Smallmouth		210,000	38,250	248,250
Rock bass			123,600	123,600
Sunfish			27,300	27,300
Manchester, Iowa:				
Brook trout			186,650	186,650
Loch Leven trout			49,500	49,500
Rainbow trout			134,870	134,870
Rock bass			7,500	7,500
Smallmouth black bass			10,590	10,590
Nashua, N. H.:				
Brook trout			188,100	188,100
Landlocked salmon			11,000	11,000
Loch Leven trout			8,000	8,000
Rainbow trout			20,575	20,575
Catfish			10,000	10,000
Smallmouth black bass			700	700
Neosho, Mo.:				
Black bass, largemouth			39,440	39,440
Catfish			1,700	1,700
Crappie			24,900	24,900
Rainbow trout	853,000		5,510	858,510
Rock bass			53,300	53,300
Sunfish			77,330	77,330
Yellow perch			400	400
Bourbon, Mo.: Rainbow trout	1,036,000			1,036,000
Natchitoches, La.:				
Black bass, largemouth			55,735	55,735
Sunfish			71,755	71,755
Warmouth bass			3,600	3,600
Tishomingo, Okla.:				
Black bass, largemouth			77,880	77,880
Catfish			16,200	16,200
Crappie			106,600	106,600
Rock bass			29	29
Sunfish			116,655	116,655
Warmouth bass			24,900	24,900
Yellow perch			5,600	5,600

Stations and substations operated and the output of each, fiscal year 1935—Continued

Stations and substations and species	Eggs	Fry	Fingerlings, yearlings, and adults	Total
Northville, Mich.:				
Black bass:				
Largemouth			2,275	2,275
Smallmouth			51,000	51,000
Brook trout			336,300	336,300
Loch Leven trout			270,665	270,665
Rainbow trout			365,200	365,200
Steelhead salmon		47,300		47,300
Orangeburg, S. C.:				
Black bass, largemouth			258,400	258,400
Catfish			310	310
Crappie			1,040	1,040
Shad			3,350	3,350
Sunfish			160,340	160,340
Warmouth bass			7,970	7,970
Pittsford, Vt.:				
Blackspotted trout			15,000	15,000
Brook trout			44,700	44,700
Rainbow trout			15,900	15,900
Put in Bay, Ohio:				
Pike perch	510,075,000			510,075,000
Whitefish	50,000	37,000,000		37,050,000
Quinault, Wash.:				
Blackspotted trout			234,520	234,520
Brook trout			121,010	121,010
Chinook salmon			57,800	57,800
Silver salmon	50,000		1,513,500	1,563,500
Sockeye salmon			1,183,800	1,183,800
Duckabush, Wash.: Chum salmon		13,993,300		13,993,300
Quilcene, Wash.:				
Blackspotted trout			250,000	250,000
Brook trout			59,000	59,000
Chum salmon		1,262,000		1,262,000
Sockeye salmon			250,000	250,000
Steelhead salmon			185,500	185,000
National Forest of N. H.:				
Brook trout	2,000,000	2,050,000	489,600	4,539,600
Landlocked salmon			635	635
St. Johnsbury, Vt.:				
Black bass, smallmouth			9,765	9,765
Landlocked salmon			23,100	23,100
San Marcos, Tex.:				
Black bass, largemouth		176,000	151,140	327,140
Crappie			5,275	5,275
Sunfish			46,600	46,600
Fort Worth, Tex.:				
Black bass, largemouth			58,000	58,000
Catfish			3,700	3,700
Crappie			12,800	12,800
Sunfish			76,900	76,900
Saratoga, Wyo.:				
Blackspotted trout			349,470	349,470
Brook trout			1,157,165	1,157,165
Loch Leven trout			229,060	229,060
Rainbow trout			121,400	121,400
Spearfish, S. Dak.:				
Black bass, largemouth			14,575	14,575
Blackspotted trout			130,200	130,200
Brook trout			563,350	563,350
Loch Leven trout			715,000	715,000
Rainbow trout	50,000		945,550	995,550
Springville, Utah:				
Black bass, largemouth			2,110	2,110
Blackspotted trout			640,000	640,000
Brook trout	101,900		249,200	351,100
Loch Leven trout			1,514,440	1,514,440
Rainbow trout	1,068,630		427,220	1,495,850
Bear Lake, Utah:				
Brook trout			498,100	498,100
Rainbow trout			71,420	71,420
Sockeye salmon			263,000	263,000
Marion, Ala.:				
Black bass, largemouth			172,850	172,850
Sunfish			201,400	201,400
Tupelo, Miss.:				
Black bass, largemouth		50,500	181,000	231,500
Sunfish			225,900	225,900

Stations and substations operated and the output of each, fiscal year 1935—Continued

Stations and substations and species	Eggs	Fry	Fingerlings, yearlings, and adults	Total
Valdosta, Ga.:[1]				
Warm Springs, Ga.:				
Black bass, largemouth		3,750	174,350	178,100
Catfish			2,970	2,970
Crappie			115	115
Sunfish			417,650	417,650
Warmouth bass			125	125
White Sulphur Springs, W. Va.:				
Black bass, largemouth		51,000	550	51,550
Brook trout			1,926,675	1,926,675
Loch Leven trout			381,630	381,630
Rainbow trout	221,000		525,300	746,300
Rock bass			7,025	7,025
Sunfish			39,025	39,025
Woods Hole, Mass.:				
Flatfish	35,859,000	144,518,000		180,377,000
Mackerel		2,123,000		2,123,000
Wytheville, Va.:				
Black bass:				
Largemouth			7,900	7,900
Smallmouth			7,670	7,670
Brook trout			786,360	786,360
Catfish			1,725	1,725
Rainbow trout	795,000		893,900	1,688,900
Rock bass			18,400	18,400
Sunfish			74,900	74,900
Yellowstone Park, Wyo.:				
Blackspotted trout	2,850,000		11,767,000	14,617,000
Grayling	675,000			675,000
Moose, Wyo.:				
Blackspotted trout			1,386,000	1,386,000
Brook trout			92,200	92,200

[1] No output due to construction work.

NOTE.—Figures for "eggs" denote eggs planted or transferred to agencies outside of Bureau. Eggs transferred to other Bureau stations are shown separately by table on page 409.

EGG COLLECTIONS

As would be expected, the increased output of fish was based upon a larger collection of the raw material, namely, fish eggs. The attached tables give comparison of the 1935 and 1934 collections indicating in which species variations occurred.

Comparison of egg collections, fiscal years 1934 and 1935

Species	1934	1935	Species	1934	1935
Shad	17,104,000	5,280,000	Grayling	2,118,400	
Whitefish	12,000,000	54,895,000	Pike perch	840,920,300	519,075,000
Chinook salmon	28,323,000	29,919,000	Yellow perch	6,430,000	14,000,000
Chum salmon	12,370,000	21,138,000	White perch	1,600,000	2,400,000
Humpback salmon	158,000		Cod	1,037,262,000	1,753,129,000
Silver salmon	2,148,000	3,398,000	Haddock	291,754,000	264,483,000
Sockeye salmon	9,157,000	3,326,000	Pollock		523,622,000
Steelhead salmon	905,000	1,352,000	Winter flounder	1,036,626,000	1,375,129,000
Landlocked salmon	35,000		Mackerel	8,592,000	2,800,000
Rainbow trout	25,770,253	21,365,920	Lake herring		5,520,000
Blackspotted trout	28,946,550	21,206,000	Carp		83,250,000
Loch Leven trout	29,329,624	30,372,000	Buffalofish		214,046,000
Lake trout	1,850,120	2,684,000			
Brook trout	28,331,758	29,265,500	Total	3,315,039,305	4,981,655,420

NOTES ON OPERATIONS

COMMERCIAL SPECIES

Pacific salmons.—While there was a moderate increase in the production of the less important species of Pacific salmon, the silver and chum, the output of chinook and sockeyes dropped. The distribution of the latter in particular was but a small fraction of the normal production of preceding years. This was due to cessation of operations in Alaska where sockeye eggs have been obtainable in large numbers. In addition, the run of sockeyes at the Quinault, Wash., station was negligible. This station is the main field of activity with this species outside of Alaska.

In the Columbia River territory operations proceeded in approximately normal scope, but a light run of fish in the Big and Little White Salmon Rivers curtailed the output of chinook salmon. Effort was made to augment the water supply at the main station (Clackamas, Oreg.) by digging a well without success. Some new rearing tanks were constructed. At the Butte Falls, Oreg., substation serving the Rogue River territory, chinook egg collections were good but the operations with steelhead trout were unsatisfactory due to the immaturity of the eggs when the fish entered the traps.

The Salmon, Idaho, substation was operated on a part-time basis, chiefly for the handling of rainbow trout eggs.

Total egg collections at the Birdsview, Wash., station were below last year's take. A number of improvements, including completion of a dwelling, work upon Grandy Creek and the water-supply system, traps, etc., as well as minor jobs, were effected by relief labor. Sockeye salmon marking experiments were continued.

The Baker Lake substation was operated during the summer and fall months only and propagated only trout. A rock-slide arising from flood conditions blocked the water supply and Civilian Conservation Corps labor was obtained to remove it. The Mount Rainier, Wash., substation furnished about 600,000 trout for park waters. Effort is being made to develop egg-collecting fields in several lakes in the national park.

The most noteworthy item at the Quinault, Wash., station was the greatly reduced run of sockeye salmon. However, sufficient eggs of various species were obtained to utilize to capacity the rearing facilities of the station.

The Duckabush and Quilcene, Wash., substations as usual concentrated on the handling of chum salmon. Repeated damage to racks and traps by high water affected operations, but in spite of this a large collection of late-run chum salmon eggs was obtained.

In the California field the collection of chinook salmon eggs was concentrated at the Mill Creek substation. Of the 4,000,000 taken, 1,500,000 were transferred to the Baird station for incubation.

GREAT LAKES SPECIES

Comparable to last year, propagation of commercial species of the Great Lakes was confined to the Duluth, Minn., Put in Bay, Ohio, and Cape Vincent, N. Y., stations. The former succeeded in collecting a moderate number of lake trout and whitefish eggs during the regular open season. The quality of them was rather poor, due to lateness of the collecting season. A considerable number of game-

trout eggs were hatched, part of the fish being used in stocking rearing ponds constructed by the United States Forest Service. The State of Minnesota furnished a limited number of pike-perch eggs during the spring.

At the Cape Vincent, N. Y., station eggs of whitefish, lake trout, and lake herring, yielding slightly over 3,000,000 fry, were obtained from local fishermen. The main activities here are now concerned with the propagation of game fish, particularly smallmouth bass, and the administration of the three substations where trout are reared. This work has continued to be of increasing importance. The pike-perch hatchery on Lake Champlain at Swanton, Vt., was operated jointly by the States of Vermont and Connecticut.

The work at the Put in Bay, Ohio, station was closely tied in with that of the State hatchery. The Bureau collected 51,000,000 whitefish eggs, which were hatched and distributed from the State hatchery. During the spring over 500,000,000 pike-perch eggs were collected by the Bureau's force, with State facilities being used for hatching. The dock at the Bureau's station has disintegrated to the point where it is no longer safe for use. The Bureau's vessel *Shearwater* is now operated by the State, serving both hatcheries.

MARINE SPECIES

At the Boothbay Harbor, Maine, station one of the steam pumps and boilers was replaced by an electric pump, adding greatly to the efficiency and economy of operations. A new hot-water system was also required and installed as a result of this change. The flatfish propagation was conducted in the usual manner. However, a larger number of brood fish yielded a smaller number of eggs than during the previous year. Operations with the cod and haddock consisted of fertilizing and planting on the spawning grounds eggs taken in connection with commercial fisheries. The 729,000,000 cod eggs and the 120,000,000 haddock eggs thus handled were really a byproduct recovery.

At Woods Hole, Mass., a new water-supply suction line was installed. Due to shortage of funds, no cod were propagated, but 144,000,000 flounder fry were produced, together with a limited number of mackerel.

The Gloucester, Mass., station was reopened early in July after a 9-month closure. Considerable work was required in overhauling boilers, pumps, fish-cultural equipment, and in renovating the buildings, all of which were deteriorated. Everything was placed in readiness to permit propagation of pollock during the winter months. Part of the one-half billion eggs secured were planted on the spawning grounds directly from the fishing boats, the balance being incubated at the hatchery. In the spring the work of planting fertilized cod, haddock, and flounder eggs was taken up. Spawntakers placed aboard commercial fishing vessels encountered unusually favorable conditions, and large numbers of eggs were obtained. This station is of chief value in maintaining a local inshore fishery.

ANADROMOUS SPECIES OF THE ATLANTIC COAST

The propagation of commercial species native to east coast rivers was formerly much more extensive, but changing conditions accompanying development and industrialization have rendered such work

futile in many sections. Accordingly, the propagation of Atlantic salmon was confined to the Craig Brook, Maine, station, while work with the shad was centered on the Potomac River at the Fort Belvoir, Va. (formerly Fort Humphreys) station. It was again possible to secure 1,000,000 Atlantic salmon eggs from Canada, and these were distributed to various State hatcheries in Maine, with the exception of a limited number hatched at the Federal hatchery at Craig Brook. This procedure was followed for greater economy and efficiency in distribution.

The Fort Belvoir, Va., hatchery bettered last season's production of shad and resumed propagation of yellow perch with a very satisfactory production of over 400 million fry. This work does not conflict with shad operations but is rather supplementary and involves slight extra cost. Some minor improvements were made to the station buildings and grounds.

At the Edenton, N. C., station, yellow perch and white perch, as well as shad, were handled. Eight and a quarter million eggs of the former species were obtained. The commercial shad fishery from which the shad eggs are obtained was not particularly successful, and the output of fry amounted to only three and a half million. The station also propagated pond fish.

The Orangeburg, S. C., station again operated a small shad hatchery on the Edisto River as a cooperative project with the State of South Carolina.

GAME-FISH PROPAGATION

Artificial propagation of commercial species is largely a replenishment process, supplementing natural production. This is true with the game varieties also but in addition virtual extinction of certain species in certain sections is forestalled by the hatchery activities.

The Bureau's game fish hatcheries were operated with the conception that they were producing the basis of a great national recreation, and the areas devoted to recreation—the national parks and forests—were the subject of special attention. The numerical output of these varieties has been discussed elsewhere. The rising cost of the meats commonly used as fish food has constituted the most serious problem confronting this phase of our work. The requirements for larger fish necessitate feeding for long periods and rigid economy is essential if the game fish output is to be kept up in size and numbers. Distribution of the fish affords one of the best fields for cost reduction; and by using State facilities, as well as requiring private applicants to handle their allotments, production has been maintained at a high level. The findings of the Bureau's biologists engaged in aquicultural investigations have been applied at the hatcheries wherever practicable. The following summaries covering the work of the individual stations will, however, illustrate more fully the nature of the year's work.

ROCKY MOUNTAIN TERRITORY

At the close of the year all arrangements were being put into effect for the consolidation of the Rocky Mountain and Pacific coast territories to be administered by a regional director located at Seattle, Wash.

The activities at the Yellowstone Park substation were administered from the Salt Lake City headquarters. Inasmuch as the work covering the midsummer months extends into parts of two fiscal years, the data furnished here cover the summer of 1934. The total collection of black-spotted trout eggs exceeded 38,000,000, surpassing any previous season. Over 4,000,000 grayling eggs were also collected. The destruction of penned fish and pens by bears was halted by simply keeping dogs in the vicinity of the racks. The larger percentage of the output was retained for restocking in Yellowstone Park or in other national parks. A new water supply line was installed.

At the Springville, Utah, station the brood stock of rainbow trout yielded over 2,000,000 eggs, an increase of almost half a million over last year. A 1¼-acre bass pond was completed with relief labor.

The Bear Lake, Utah, substation handled about 1,300,000 trout eggs. Some losses were experienced in rearing the fry and fingerlings. This was traced to excess nitrogen in the water and was corrected by aeration. The station hatched about 250,000 landlocked sockeye salmon known as "silver trout", for planting in local waters.

The Spearfish, S. Dak., station received over 10,000 hours of relief labor which was utilized in overhauling the pond system, renewing the water supply system, and numerous improvements to buildings and grounds which have greatly improved the efficiency and appearance of the plant. Approximately 7,300 cans of trout fingerlings were distributed providing for ample stocking of the territory served by this hatchery.

The Saratoga, Wyo., station was able to accomplish little in the way of major improvements, although a small Civilian Conservation Corps detail was used in building a wall along the creek through the station grounds. Fish-cultural work was conducted at a normal level with a good take of black-spotted trout eggs from station brood stock.

In the Colorado field, the Leadville station has partially completed a new rearing pond. This station together with the substation at Creede cooperated with private parties in the collection of trout eggs, and the two establishments handled over 12½ million eggs. The substation at Crystal Lake was used chiefly for rearing purposes. A 1½-acre earth rearing pond was constructed at Creede with Civilian Conservation Corps labor. Flood waters destroyed a dam in a storage reservoir at the Leadville station, affecting the power plant water supply.

At the Hagerman, Idaho, station a cold-storage room was installed, power being generated on the premises. Some work was done on overhauling the living quarters. While there was considerable loss on eggs shipped in from other points, operations as a whole were satisfactory and the rapid growth of the fish at this station makes it a valuable unit.

The Salmon, Idaho, substation was operated during the summer months for the rearing of fish derived from egg collections at Williams Lake. The take of over 3,500,000 eggs at this point exceeded all previous records.

Civilian Conservation Corps labor was available at the Crawford, Nebr., station for repairs and improvements to bass and trout ponds on the Fort Robinson Reservation.

The extensive operations in the Montana territory were highly successful.

Through assignments of relief workers and an assignment from the Civilian Conservation Corps, a limited amount of construction and repair work was carried on at the Bozeman, Mont., station. Such work consisted of repairing and graveling the roadways about the station and public highway, renewing the concrete floor in the hatchery building and equipping same with new troughs, constructing a fish-food-preparation house, and completing one apartment of a duplex cottage.

Distribution of trout eggs and fingerlings was made in the usual territory consisting of 15,022,430 eggs and 4,378,900 fingerlings, 1,946,674 more fingerlings being distributed during the year than the previous fiscal year.

At the Ennis substation repair work and construction was carried on by the regular personnel and with temporary help. A new concrete floor was put in the Meadow Creek hatchery; also 20 cedar troughs with wooden standards were set up in the building. At Blaine Springs 400 feet of supply pipe was put in, and a rearing pond 100 by 12 feet was constructed.

The Loch Leven egg collections totaled 25,511,655, which was approximately 3,000,000 less than the previous year. However, the take was ample to meet all requirements. The rainbow take during the spring was a few thousand larger than the previous year.

The Blaine Springs hatchery has been in operation for over a year and has proven satisfactory in every detail. With the water of a 53° temperature, a rapid growth among the fingerling trout is encouraged.

At the Miles City, Mont., substation relief workers were used in repairing a leak in the dam of Lake Keogh, which necessitated an excavation of gravel 60 feet long, 8 feet deep, and 5 feet wide and replacing the gravel with dirt that would pack and form a compact mass.

The total number of fingerlings harvested during the fall ranked among previous years, but the most outstanding feature of the harvest was that 121,525 fingerling bass were distributed.

The Dexter, N. Mex., station is the only Federal hatchery in this territory which is solely concerned with the production of pond fish. No major construction was performed, but considerable work was applied to improving ponds, particularly the drainage. Unfavorable weather during the spawning season resulted in a subnormal hatch of fry. Maintenance of adequate water levels in the ponds is always a problem at this station.

Among the miscellaneous activities was the establishment of rearing pools on a site near Spokane, Wash., donated by the State. Under a cooperative agreement with the adjacent State hatchery, a Bureau employee has been detailed to care for the trout during the rearing period.

The Jackson Hole, Wyo., station received fingerlings by transfer and also hatched eggs. During the spring months mortality was very heavy and other difficulties were experienced. However, a goodly number of fingerlings was available for stocking waters in the Teton National Park.

NEW ENGLAND STATIONS

The Nashua, N. H., station functioned in a normal manner and achieved an average production of three species of trout and landlocked salmon.

The Hartsville, Mass., station collected nearly 500,000 brook-trout eggs, sufficient for its own requirements and also providing for shipments of several hundred thousand to other stations. The cooperative collection of smallmouth bass fry from waters supplying reservoir lakes was most successful. Seven hundred and sixty-eight thousand fry were collected and distributed, 50 percent being at the disposal of the State of Connecticut in conformity with the existing agreement.

The East Orland, Maine, station took 6,860,000 brook-trout eggs from station stock. This was below the figure for the previous year due to the fact the brood stock is being reduced. Three hundred thousand landlocked salmon eggs were furnished by the State of Maine, and by exchange Canadian Atlantic salmon eggs to the number of 1,000,000 were obtained. An agreement was consummated with the State of Maine for the joint distribution of trout and salmon, and the output was moved at negligible cost to the Bureau. A few smelt eggs were handled. Some improvement and repair work was performed upon the ponds and water-supply system, including a start on the construction of two circular rearing ponds.

By continuation of the use of Civilian Conservation Corps labor and relief labor, the long-range development program for the York Pond, N. H., brook-trout station was brought nearer to completion. The nature of the work accomplished is too extensive for description here but one of the most important features was a new bulkhead at the outlet of York Pond and a new canal system for the power house. Realinement of rearing ponds, landscaping, and numerous minor jobs were prosecuted. Due to the disturbances arising from construction, the collections of brook-trout eggs were slightly less than last year. A cooperative arrangement in effect with the State of Vermont has resulted in financial aid to the program of rearing and distribution carried on from this station. The St. Johnsbury, Vt., station has been used as an auxiliary principally in handling the eggs destined for shipment from York Pond. The St. Johnsbury station enjoyed unusual success in the rearing of landlocked salmon during the year. The hatchery building was repainted.

The Pittsford, Vt., station, in addition to its strictly experimental work, produced some brook-trout eggs for shipment and distributed a considerable number of fingerling trout. It is rearing several varieties not native to New England, including grayling and golden trout, and has a stock of the rare Sunapee, or white trout.

COMBINATION TROUT AND POND-FISH STATIONS

At the Northville, Mich., station eight daphnia ponds were constructed for the production of bass food. Relief labor was used to complete the bass ponds and grade the station grounds. A satisfactory production of trout and bass was obtained. The Conservation Departments of Indiana, Michigan, and Ohio cooperated in the distribution of the output in their respective States. Five rearing projects handling about 450,000 trout were operated under the direction of this station.

At the Neosho, Mo., station the fall and summer collections of pond fish were approximately as during the previous year. The spring collections of largemouth bass were only 10 percent of those of

last year, due to almost constant rains, which broke up the bass schools, and to cool weather.

Ichthyophthirius developed at Neosho and became epidemic for the first time in 10 years. Selective breeding of rainbow trout has been continued along the lines previously reported. The distribution of trout was adequate to meet all requirements for that section.

At the Bourbon, Mo., substation the production of eyed rainbow eggs was approximately the same as that of last season and the hatching and rearing of the rainbow trout has been most successful. This substation is operated upon a cooperative basis by this Bureau in connection with the owners of the property. By agreement the Bureau receives 90 percent of all rainbow spawn.

Owing to a reduction in the brood stock the output of the Manchester, Iowa, station was considerably reduced from that of last year. Three thousand brood rainbow trout yielded 2,496,000 eggs. Consignments totaling 2,000,000 eyed eggs were shipped to applicants, State or Government establishments. The smallmouth black bass and rock bass produced a fair yield of eggs, and 10,860 large fingerling smallmouth bass, and 7,500 rock bass were distributed.

The Leetown, W. Va., station was engaged in numerous experimental activities which are discussed in the Report of the Division of Scientific Inquiry. However, over 600,000 fry, fingerlings, and adults were distributed. The hatch of trout eggs was poor due to carbon dioxide in the water supply. Other diseases were noted during the year and appropriate remedial measures applied. The station produced its first hatch of bass and has experimented with the rearing of the fry in trout ponds. Construction performed included the claying of the bottoms of seven bass ponds and the construction of one new pond. Concrete bottoms were placed in two long trout raceways. A dwelling for the director was completed during the year, and work was started on a fish culturist's cottage.

The new Lamar, Pa., station was in active operation although no fish were hatched. Trout fry transferred from other stations were reared, producing over 50,000 good-sized fish for distribution. Eight circular rearing ponds and four 50-foot raceways were constructed, and property lines were fenced. Several hundred feet of road were constructed.

The Flintville, Tenn., station has reduced its rainbow brood stock with consequent reduction in egg take. Surplus fish were turned over to the State. Production of pond fish was limited due to the fact that wild brood stock from Reelfoot Lake had not become fully acclimated.

Operations at the Erwin, Tenn., station were of a routine nature. Cooperative arrangements for the rearing of trout were in effect with sportsmen's organizations and the State.

At the White Sulphur Springs, W. Va., station painting of the station buildings was completed. A smaller number of eggs was secured from rainbow brood stock than was the case the previous year, but the percentage of the hatch was higher. Almost 100,000 pond fish were produced, an increase of 36,000. The station hatched trout eggs for the State of West Virginia, as has been done previously.

The total distribution of all species from the Wytheville, Va., station was slightly below the previous year, but as a whole the year's work was satisfactory. Large numbers of eggs and fish were assigned to the States of Virginia and North Carolina.

POND-FISH STATIONS

The hatcheries engaged in the culture of the warm-water or pond fishes are essentially a series of artificial ponds stocked with brood fish. The real fish-cultural work, therefore, lies in the management applied to these ponds. The output is somewhat at the mercy of weather and other uncontrollable factors; and, aside from fluctuations in production, a recital of station activities is largely a statement of routine.

At the Warm Springs, Ga., station reconditioning of buildings and grounds was continued with relief labor or funds. An old building was razed and the material used for other repairs. Two retaining walls were erected, and work was performed upon the ponds. The output of fish was slightly less than last year.

At Valdosta, Ga., construction work prohibited any production of fish. The construction activities included a reinforced concrete dam and necessary structures at the outlet giving complete control of the drainage wells. Eight thousand feet of ditches were excavated to facilitate drainage of the lake. Four holding pools were created by erecting dykes and concrete outlets in the bed of the lake. Other work comprised improvement of the holding shed and its water supply, fencing, roads, etc.

At the San Angelo, Tex., station, operated under the jurisdiction of the San Marcos, Tex., station, a dwelling, shop, and garage were completed and two ponds developed to the point where fry could be transferred to them for rearing.

At the Orangeburg, S. C., station two small mud ponds were completed. A number of the buildings were painted. The production of fish approximating a total of 500,000 was more than 100,000 in excess of last year's output. The cooperative shad work on the Edisto River gave very limited results, however.

At the Marion, Ala., station results in fish-cultural work this year were gratifying both as to the size and numbers of fish produced. A total of 434,280 fingerlings were delivered to applicants and 116,500 bass were planted in station rearing ponds. No fish were handled in the advanced fry stage this year. During the year 8 additional ponds were constructed covering a total of 28.73 acres, increasing the pond system to 51 ponds with a total water area of 100 acres. Another flowing well was brought in during the fall, and there is now sufficient water to supply ponds additional to those already constructed. Construction of buildings was continued during the first half of the year and there were completed during this period, one brick veneer dwelling, one large frame barn, two small barns, and one shipping shed. A large log cabin at Perry Lake, on the east side of the property and 1 mile from the office, was nearly completed. A telephone line was constructed to Marion, a distance of 7 miles.

Adverse weather conditions at the Louisville, Ky., station, with other unusual factors, caused a decrease in the output of smallmouth bass fry. During the year 133,000 smallmouth bass fry and 5,070 fingerlings were distributed, as well as 210,000 largemouth bass fry and 21,611 fingerlings. The latter were produced in increased numbers.

Considerable excavation of earth from upper portions of ponds, the uncovering of water supply and sewer lines for leaks; also other con-

struction work such as pouring a 4-inch concrete wall through embankments of ponds to prevent crayfish from tunneling from one pond to another, the widening of pond A, and other necessary work have been accomplished with labor furnished by the local welfare agency.

The Fairport, Iowa, station has become of increasing importance in the production of pond fish required to meet applications formerly filled with rescued fish. Relief labor was employed for a complete renovation of the pond system and other activities incidental to maintenance.

At the Tishomingo, Okla., substation the pond area has been increased during the past year by workers from the Federal Emergency Relief Administration so that at present there are 33 acres in ponds. Four miles of standard grade 40-foot highway was constructed to the station by the State. Interest is centered on the production of channel catfish at this hatchery and to date the work has been fairly successful.

At the Natchitoches, La., station the production has been approximately the same as during the previous year. Experiments are being conducted with fertilizers, their use and quantity per acre in order to procure data to determine the best methods of quantity production of pond fishes. The pond area of this station is being increased through the work of the Federal Emergency Relief Administration and this new area will be in production during the spring of 1936.

MISSISSIPPI RIVER TERRITORY

Fisheries matters in the Upper Mississippi Wild Life and Fish Refuge, and hatchery activities in the North Central States were supervised from the La Crosse, Wis., headquarters. This station hatched successfully over a million game trout and operated several bass ponds at the hatchery and in the adjacent territory. In addition, it supervised the rescue or salvage work in the refuge (discussed elsewhere) and cooperated in the collection of lake trout eggs in the Illinois waters of Lake Michigan. Three large trout rearing units in the national forests were stocked or supervised from this point, and the work also included supervision and stocking of private cooperating rearing ponds at 39 different locations in nearby States.

The construction of dams as a part of the 9-foot channel project for the Mississippi River is greatly changing conditions in this vicinity. Several semicontrolled ponds used for rearing bass have already been rendered useless and certain parts of the territory formerly covered by rescue crews are being flooded. As construction progresses these effects will be extended. The Bureau has developed plans for construction of propagating ponds adjacent to the new dams but no funds have been obtainable for the carrying out of these plans.

The Homer, Minn., substation affords shop and repair facilities for overhauling equipment and was used for this purpose as well as a center for rescue work.

The new Rochester, Ind., hatchery, in its second year of production, received the benefit of relief labor throughout the greater part of the year. This resulted in creation of additional ponds to the extent of more than 6 acres and the partial completion of another pond. Minor jobs required for the completion of the dwellings and other buildings were attended to. Due to drought conditions, the water supply was

inadequate to maintain the ponds throughout the season and the fish were distributed in July and August, thereby reducing the output of larger fish.

At the Lake Mills, Wis., substation there was a production of trout and pond fish commensurate with the facilities available.

AQUARIUM

The aquarium located under the main lobby in the Department of Commerce Building is maintaining its reputation as one of Washington's popular points of interest for visitors. The numerous organizations which gather for conventions in Washington, as a rule, include the aquarium in their itinerary of sightseeing.

The general exhibits were maintained in much the same manner as during the previous year and the display of trout has continued to be a point of particular interest. However, from time to time during the year it has been the practice to introduce more novel exhibits, one of which was a 500-pound green turtle. Another interesting novelty was a pair of piranha—the small man-eating fish of the Amazon Basin.

The number of specimens and species on display have varied from time to time, but as a rule from 1,500 to 2,000 individual specimens representing more than 50 different varieties are shown. Replacement specimens were obtained from several of the Bureau hatcheries, the majority being obtained from the La Crosse, Wis., territory.

The aquarium also was of great service in preparing and forwarding foreign shipments of live fish and eggs which were made to Puerto Rico, Panama, and Venezuela.

As usual the display of model hatching apparatus was kept in operation for the purpose of illustrating the methods followed in incubating various types of eggs.

DISTRIBUTION OPERATIONS

The large number of fish distributed in the waters of the national forests and national parks was to a large extent handled by those agencies themselves. In a number of instances sportsmen's clubs cooperated in distributing fish throughout a large territory. This was particularly evident in connection with the operations at the Spearfish, S. Dak., station. The trend is constantly toward the use of trucks for distribution purposes, and the fish cars are used only for the longer hauls.

The distribution cars engaged in the delivery of fish to applicants this year made 65 trips and carried an average of 250 pails per trip. The cars traveled 45,435 paid miles and 8,958 free miles. Detached messengers made 49,665 paid miles and 4,725 free miles in delivering fish to applicants. Truck deliveries during the year aggregated 40,351 miles. As formerly, the Bureau received free transportation and reduced rates from a number of railroads.

It is the Bureau's policy to notify applicants when their fish are ready for delivery and ask them to call at the hatchery to receive them. After the applicants have been notified and sufficient time has elapsed, if they do not call for their fish the same are planted in suitable waters. This course has been made necessary owing to shortage in distribution funds.

Summary, by States, of the distribution of fish, fiscal year 1935

State and species	Number
Alabama:	
Largemouth black bass	206,675
Loch Leven trout	10,000
Rainbow trout	3,250
Sunfish	263,925
Arkansas:	
Largemouth black bass	197,350
Smallmouth black bass	32,550
Rock bass	52,750
Sunfish	21,100
California: Chinook salmon	5,681,000
Colorado:	
Blackspotted trout	816,800
Brook trout	5,088,400
Loch Leven trout	302,000
Rainbow trout	1,573,000
Connecticut:	
Brook trout	8,100
Rainbow trout	16,700
Smallmouth black bass	7,500
Delaware: Largemouth black bass	3,375
Florida: Sunfish	500
Georgia:	
Brook trout	91,000
Catfish	3,910
Largemouth black bass	281,300
Rainbow trout	40,240
Sunfish	269,300
Idaho:	
Blackspotted trout	216,000
Brook trout	378,000
Largemouth black bass	6,100
Loch Leven trout	18,000
Rainbow trout	762,000
Steelhead salmon	12,000
Illinois:	
Brook trout	125
Catfish	1,000
Largemouth black bass	17,100
Smallmouth black bass	300
Rainbow trout	375
Sunfish	2,600
Indiana:	
Brook trout	28,750
Catfish	750
Largemouth black bass	58,750
Smallmouth black bass	8,960
Rainbow trout	168,500
Rock bass	500
Sunfish	4,200
Yellow perch	600
Iowa:	
Catfish	2,000
Crappie	20,700
Largemouth black bass	39,650
Rainbow trout	15,500
Loch Leven trout	4,000
Sunfish	6,700
Kansas:	
Crappie	6,800
Largemouth black bass	1,925
Rock bass	2,100
Sunfish	2,200
Kentucky:	
Largemouth black bass	223,640
Smallmouth black bass	10,500
Rock bass	3,350
Sunfish	16,900
Louisiana:	
Largemouth black bass	24,760
Sunfish	13,730
Maine:	
Atlantic salmon	85,000
Brook trout	1,805,100
Flounder	774,000,000
Landlocked salmon	238,300
Smallmouth black bass	33,750
Maryland:	
Brook trout	58,110
Largemouth black bass	1,350
Smallmouth black bass	550
Loch Leven trout	900
Maryland—Continued.	
Sunfish	41,000
Rainbow trout	17,300
Massachusetts:	
Brook trout	275,900
Catfish	1,800
Flatfish	144,518,000
Mackerel	2,123,000
Pollock	95,782,000
Loch Leven trout	3,000
Lake trout	1,750
Landlocked salmon	2,000
Rainbow trout	8,375
Smallmouth black bass	341,800
Michigan:	
Brook trout	389,700
Lake trout	174,000
Loch Leven trout	21,000
Largemouth black bass	13,300
Smallmouth black bass	29,850
Pike perch	600,000
Rainbow trout	293,600
Sunfish	9,740
Whitefish	1,500,000
Yellow perch	1,500
Minnesota:	
Brook trout	243,900
Catfish	279,000
Carp	1,601,000
Buffalofish	10,770
Crappie	3,033,000
Lake trout	119,000
Largemouth black bass	18,580
Smallmouth black bass	3,100
Rainbow trout	48,800
Loch Leven trout	61,800
Pike perch	5,020,000
Sunfish	3,265
White bass	1,800
Yellow perch	383,000
Mississippi:	
Largemouth black bass	180,175
Sunfish	201,000
Missouri:	
Catfish	400
Crappie	17,450
Largemouth black bass	94,020
Rainbow trout	3,240
Rock bass	20,900
Sunfish	6,240
Montana:	
Blackspotted trout	414,420
Brook trout	139,615
Catfish	87,530
Crappie	53,600
Largemouth black bass	121,950
Loch Leven trout	2,252,000
Sunfish	91,200
Yellow perch	5,800
Nebraska:	
Brook trout	274,300
Catfish	2,800
Crappie	1,500
Loch Leven trout	138,800
Largemouth black bass	11,950
Rainbow trout	609,300
Sunfish	1,675
Yellow perch	3,000
Nevada:	
Catfish	200
Largemouth black bass	800
New Hampshire:	
Brook trout	79,400
Catfish	9,400
Landlocked salmon	7,000
Rainbow trout	9,200
Smallmouth black bass	500
New Jersey:	
Largemouth black bass	32,400
Rainbow trout	5,000
Sunfish	75
Yellow perch	500

Summary, by States, of the distribution of fish, fiscal year 1935—Continued

State and species	Number
New Mexico:	
Blackspotted trout	36,000
Crappie	800
Largemouth black bass	146,450
Rainbow trout	12,000
Sunfish	158,400
New York:	
Brook trout	443,500
Lake trout	322,000
Landlocked salmon	500
Loch Leven trout	94,000
Lake herring	2,640,000
Rainbow trout	19,200
Smallmouth black bass	73,200
Whitefish	679,000
North Carolina:	
Crappie	2,500
Largemouth black bass	58,000
Shad	2,775,000
Yellow perch	6,600,000
White perch	920,000
Sunfish	30,325
North Dakota: Rainbow trout	1,000
Ohio:	
Brook trout	6,300
Catfish	8,250
Loch Leven trout	9,500
Largemouth black bass	15,300
Smallmouth black bass	32,400
Rainbow trout	10,800
Sunfish	11,450
Whitefish	37,000,000
Oklahoma:	
Catfish	11,600
Crappie	90,200
Largemouth black bass	28,800
Sunfish	62,950
Warmouth bass	21,800
Yellow perch	2,630
Oregon:	
Black-spotted trout	85,000
Brook trout	385,000
Chinook salmon	5,364,000
Loch Leven trout	305,000
Rainbow trout	6,000
Silver salmon	362,000
Steelhead salmon	489,000
Pennsylvania:	
Brook trout	345,000
Catfish	2,975
Largemouth black bass	2,100
Loch Leven trout	221,200
Rainbow trout	215,800
Sunfish	4,000
Yellow perch	9,300
South Carolina:	
Catfish	170
Crappie	500
Largemouth black bass	223,000
Shad	371,000
Sunfish	137,000
Warmouth bass	8,000
South Dakota:	
Black-spotted trout	122,200
Brook trout	324,000
Catfish	600
Largemouth black bass	14,000
Loch Leven trout	609,500
Rainbow trout	649,300
Tennessee:	
Brook trout	98,600
Catfish	5,225
Tennessee—Continued.	
Crappie	315
Largemouth black bass	59,000
Smallmouth black bass	385
Loch Leven trout	5,000
Rainbow trout	150,000
Rock bass	9,150
Sunfish	37,700
Texas:	
Crappie	5,335
Largemouth black bass	241,800
Sunfish	45,600
Rock bass	750
Utah:	
Black-spotted trout	640,000
Brook trout	682,700
Largemouth black bass	2,100
Loch Leven trout	1,514,000
Landlocked salmon	18,200
Rainbow trout	478,700
Vermont:	
Atlantic salmon	5,000
Brook trout	1,984,300
Landlocked salmon	33,000
Loch Leven trout	2,000
Rainbow trout	2,050
Smallmouth black bass	49,765
Virginia:	
Catfish	1,200
Brook trout	315,975
Largemouth black bass	15,150
Smallmouth black bass	8,830
Loch Leven trout	2,800
Rainbow trout	248,800
Rock bass	19,300
Shad	11,430,000
Sunfish	52,700
Yellow perch	451,000,000
Washington:	
Black-spotted trout	638,000
Brook trout	697,500
Chinook salmon	8,554,000
Landlocked salmon	25,900
Loch Leven trout	165,500
Rainbow trout	279,250
Silver salmon	413,000
Sockeye salmon	404,000
Steelhead salmon	523,000
West Virginia:	
Brook trout	1,490,000
Largemouth black bass	51,000
Smallmouth black bass	10,000
Loch Leven trout	119,000
Rainbow trout	367,000
Rock bass	200
Sunfish	22,000
Wisconsin:	
Brook trout	623,400
Catfish	17,600
Largemouth black bass	188,300
Smallmouth black bass	5,310
Loch Leven trout	251,400
Rainbow trout	258,300
Sunfish	26,300
Wyoming:	
Black-spotted trout	871,000
Brook trout	1,226,000
Catfish	2,850
Largemouth black bass	7,350
Loch Leven trout	360,000
Rainbow trout	451,000
Yellow perch	32,200

NOTE.—All buffalofish and carp shown in the above table are planted in commercial areas of the Mississippi River.